

TOPIC: UPI vs Credit Cards: How Payment Innovation Is Forcing Banks to Rethink Business Models

Hitali Khatri

Abstract

This paper examines how Unified Payments Interface (UPI) and credit cards are reshaping India's payment ecosystem and forcing banks to rethink their business models. UPI, launched in 2016, has revolutionized real-time, low-cost transactions and widened financial inclusion, while credit cards continue to dominate in high-value purchases and global acceptance. The study highlights how demonetization, government initiatives, and the pandemic accelerated digital adoption, but also exposed barriers such as limited digital literacy, rural connectivity, and risks of fraud or outages. Comparative analysis shows that while UPI enables microtransactions and empowers small merchants, its zero-MDR regime reduces banks' revenue streams, unlike credit cards which generate significant interchange and interest income. Emerging innovations; UPI Lite, Credit on UPI, Aadhaar Enabled Payment System, and the Digital Rupee- are explored as potential disruptors and enablers of convergence. The findings suggest coexistence in the short term, with long-term convergence likely to redefine banking, revenue models, and financial inclusion in India.

CHAPTER-1

In accordance with the ever changing trends and norms related to banking, digital payment has been on the rise in India since the 1980s with the introduction of credit cards and internet banking in the 2000s. The real revolution came with the introduction of mobile apps like Mobikwik and Paytm in the 2010s and the launch of UPI (Unified Payments Interface) in 2016 by the National Payments Corporation of India (NPCI).

The purpose of this study is to analyse and interpret the patterns that led to this digital payment revolution and how it affects banking as a whole and the manner in which it is making them rethink business models. The use of cash, while traditional, has presented India with several problems in the past, including terrorism financing and black money circulation. The 2016 demonetisation led to detection of black money, increase in tax collection and widening of tax base. During the period November 2016 to March 2017, the Income-tax Department conducted search and seizure actions in 900 groups leading to seizure of Rs. 900 crore, including cash of Rs. 636 crore and admission of undisclosed income of about Rs. 7,961 crore. Therefore, the 2016 demonetisation acted as a major catalyst for the shift towards a cashless economy. When the government invalidated the use of ₹500 and ₹1000 notes, the people were forced to turn to digital payment methods. The period saw a surge in the use of mobile wallets and coincided with ongoing government initiatives like Digital India, Jan Dhan Yojana and the launch of platforms such as UPI and BHIM. Moreover, the 2018 demonetisation further accelerated the growth of cashless transactions, increased financial inclusion, and pushed the informal economy towards formalisation. As a result, digital

payments became not just a convenience but a necessity, setting the stage for India's transformation into a digitally empowered economy.

Among the first countries in the world to take initiative to shift towards a cashless economy was the United States of America with the introduction of the first credit card in the 1950s. Another surge was observed with the founding of the PayPal app in 1998 and at present, USA's economy is thriving with widespread e-commerce integration and online banking. This was followed by the introduction of mobile payments in Japan in 1999 and the launching of Osaisu-Keitai in 2004.

It is no wonder that the economies of these two countries stand at first and fourth globally when they have always imagined the bigger picture and have catered new forms of payments and launched a digital revolution that soon spread to the rest of the globe, including India. This has had a great positive impact overall as in 2021, India recorded 48 billion real-time digital transactions, 40% of the global total. Every hour, nearly 5.5 million digital payments are made for shopping, salary, rent and even tips.

Germany combined.

The revolution began in 2004 when the first e-wallet called Oxigen Wallet was launched. It was licensed by RBI as a PPI provider. Despite its early mover advantage, Oxigen Wallet failed to sustain its growth and was eventually overshadowed by newer, more aggressive competitors mainly the launch of UPI in 2016.

Unified Payments Interface (UPI) is a revolutionary real-time payment system developed by the National Payments Corporation of India (NPCI) under the guidance of the Reserve Bank of India (RBI) and the Indian Banks' Association (IBA). The system works by linking a user's bank account to a unique virtual payment address (VPA), eliminating the need to enter sensitive bank details for each transaction. UPI operates 24x7 and supports features such as fund transfers, bill payments, merchant payments and more.

CHAPTER-2

India's roots lie in its rich culture and undying traditions but it is a known truth that rigidity and apprehension towards accepting new trends exist. This has also been observed in the case of digital payments as despite its rapid growth, there have been significant barriers to adoption especially in tier-2 and rural populations. Users have apprehensions about fraud, identity theft, data breaches, fear of cyberattacks and unauthorized transactions etc. Digital literacy is another significant obstacle. The elderly users lack the basic knowledge as to how to utilize digital wallets or scan QR codes and adoption is made more difficult for non-native English speakers by the scarcity of tutorials and interfaces in vernacular languages.

It is of no surprise that UPI has a very high dependency on smartphones. Urban areas, supported by better internet and smartphone access, show widespread adoption of apps like Google Pay, PhonePe, and Paytm. However, semi-rural or backward areas have limited access to smartphones and lousy internet connections. While smartphone penetration in India has exceeded 70%, but the distribution remains unequal. On one hand, the metro cities report saturation and on the other, rural India still suffers with poor connectivity, limited data packs, and outdated devices. Therefore, the users find it difficult to utilize UPI effectively.

On 12th April 2025, there was a major outage of UPI services nationwide in which all UPI platforms failed and transactions were disrupted. It lasted for about 95 minutes and was the fourth outage faced by India in just a span of two weeks. This shook the people's trust in the "always available" image that they had in mind of digital payment.

Technical difficulties and failures are the biggest downside of digital payment. There continues to be an unpredictable aspect with respect to UPI. This can pose a major problem for the users that are not tech-savvy and have already not been able to get familiar with the system.

CHAPTER-3

None of the pros of digital payment would be of any use without the trust of the people. After all, India runs on the motto “For the people, to the people and by the people.” To uphold the continuously building trust in the digital payment saga and ensure transactional security, significant steps have been taken. These include 2FA (Two-Factor Authentication). This system helps make sure that transactions are safeguarded in compliance with RBI’s security guidelines. The first step is device binding, which links the user’s UPI ID to their registered mobile number and device. The second step involves a UPI PIN, which must be entered for each transaction, ensuring that even if credentials are compromised, unauthorized transactions remain difficult to execute.

Banks and payment service providers have also integrated real-time fraud detection systems into UPI infrastructure. Transaction patterns are identified and monitored and suspicious activities are blocked instantly. For instance, unusually high transaction volumes, rapid consecutive transfers, or deviations from typical user behavior can trigger automated alerts and security checks.

For credit cards, there is EMV Chip Technology. Credit cards have transitioned from magnetic stripe systems to EMV (Europay, MasterCard, and Visa) chip technology. The EMV chip generates a unique transaction code for every purchase, making it significantly harder for fraudsters to clone cards or replicate sensitive data.

For card-not-present transactions, such as online purchases, credit cards in India are protected by two-factor authentication via OTP (One-Time Password) sent to the registered mobile number. For in-person transactions, chip-and-PIN authentication ensures that even physical possession of a Card is insufficient for unauthorized use without the correct PIN.

COVID-19 hit India like a truck. There were an estimated 5,33,570 deaths. The whole country was on lockdown. It became a risk to even step out of the house especially without masks. How could one have used cash during this time? UPI came to the rescue.

COVID-19 caused a surge in contactless and cashless transactions, thanks to the availability of QR codes. UPI allowed the people along with businesses to carry out their day to day transactions without having to worry about being sued in any sort of contact with another person. Similarly, credit cards with Near Field Communication (NFC) capabilities saw increased usage in supermarkets, pharmacies, and other essential service points.

The heightened adoption of secure, contactless methods during the pandemic has pushed banks and financial institutions to rethink their business models. Many are investing heavily in enhancing mobile payment platforms, improving fraud detection systems, and integrating value-added services to retain customers in an increasingly competitive digital payments market.

CHAPTER-4

The rapid adoption of UPI and continued relevance of credit cards have had far-reaching implications for the operational frameworks and revenue models of banks. While both instruments serve the same fundamental purpose—facilitating payments—their operational characteristics, regulatory environments, and cost structures significantly shape how banks strategize and allocate resources. This chapter examines

the constraints, consumer behavior effects, revenue impacts, and ecosystem-level consequences for banks in the evolving payments landscape.

UPI transactions in India are subject to regulatory transfer limits, typically ₹1 lakh per transaction and per day for most users, although certain banks and merchants may have lower thresholds. These limits are intended to minimize fraud risks and ensure liquidity management for banks. While adequate for small-to medium-value transactions, these caps restrict UPI's utility for high-value transfers, such as real estate payments or corporate settlements.

Credit card spending limits are determined by a customer's creditworthiness, repayment history, and income profile. Unlike UPI, which is linked to an existing bank balance, credit cards offer a revolving credit line, enabling higher-value purchases. This creates a structural distinction: UPI is constrained by the liquidity in the user's account, while credit cards extend the bank's balance sheet to the customer.

The frictionless nature of UPI payments—instant transfers, QR-based acceptance, and absence of transaction fees for users—can promote impulsive spending. The absence of a built-in credit facility makes overspending less catastrophic than with credit cards, but it can still contribute to reduced savings if spending habits are unchecked.

Credit cards pose a higher risk of overspending due to deferred payment cycles and easy access to revolving credit. This can lead to prolonged debt cycles if customers only pay the minimum amount due. Banks rely on interest income from such debt, but high delinquency rates can increase their non-performing assets (NPAs).

Credit card issuance is inherently discriminatory in favor of customers with strong credit profiles, stable income, and verifiable repayment histories. These customers receive higher credit limits, reward benefits, and lower interest rates.

Banks earn significant revenue from credit card interchange fees, merchant service charges (MDR), and interest on outstanding balances. These fees are a major incentive for banks to promote credit card usage among both merchants and customers.

The introduction of the zero-MDR regime for UPI transactions has removed merchant charges entirely, benefiting retailers but reducing revenue opportunities for banks. As UPI adoption grows, banks face pressure to recover lost fee income through alternative channels, such as subscription services or cross-selling.

UPI has been a catalyst for micro-entrepreneurs, street vendors, and small merchants, who now accept digital payments without investing in expensive point-of-sale infrastructure. This has increased financial inclusion and reduced cash-handling costs.

With fintechs and payment service providers dominating the front-end user experience, banks increasingly act as back-end settlement entities rather than primary customer engagement platforms. This “utility provider” role may reduce customer stickiness unless banks invest in their own competitive digital payment solutions.

CHAPTER 5

The Aadhaar Enabled Payment System (AEPS) has emerged as a cornerstone in India's financial inclusion strategy. Built on the Aadhaar biometric authentication framework, AEPS allows customers to perform essential banking services such as cash withdrawals, deposits, fund transfers, and balance inquiries through micro-ATMs and biometric devices linked to their Aadhaar-seeded bank accounts. This system

addresses the challenge of accessibility by extending banking services to remote and rural areas, where traditional bank branches and ATMs are often scarce (RBI, 2022).

AEPS complements the Unified Payments Interface (UPI) by catering to a different demographic segment. While UPI thrives in urban and semi-urban spaces with widespread smartphone usage and internet penetration, AEPS provides a low-technology, inclusive alternative for populations with limited digital literacy or connectivity. In this way, AEPS and UPI form a dual-track payment ecosystem that collectively bridges the digital divide, ensuring that both rural and urban citizens can participate in the financial system. A significant component of AEPS deployment lies in the role of Customer Service Points (CSPs), managed by business correspondents or local agents. CSPs function as decentralized banking outlets, enabling individuals in villages to access banking facilities without traveling long distances to formal bank branches. The familiarity of local CSP agents also enhances trust among rural users, a factor crucial for financial inclusion in low-literacy environments. Thus, AEPS, through its reliance on biometric authentication and localized service points, directly reduces the barriers of geography, technology, and trust that have historically hindered financial access in rural India.

One of the most transformative aspects of UPI is its capacity to generate digital transaction data, which can be harnessed to develop affordable, data-driven credit models. Traditional credit assessment relies heavily on collateral and documented financial history, which excludes large sections of the population, especially small merchants and informal workers. However, as Gnanakumar et al. (2022) highlight, UPI transactions provide a rich dataset that can serve as a proxy for creditworthiness. Fintech firms and banks are increasingly leveraging these digital footprints to design microcredit products, small-ticket loans, and innovative buy-now-pay-later schemes, thereby democratizing access to formal credit.

This intersection of payments and credit through UPI is particularly significant for microenterprises and low-income households. By facilitating access to working capital and affordable credit, UPI is not merely a transaction tool but a driver of economic empowerment and upward mobility. In effect, UPI transforms financial inclusion from mere access to accounts into active participation in the financial ecosystem.

Chapter 6: Conclusion and Discussion

The Unified Payments Interface (UPI) has already established itself as the backbone of India's digital payment system, yet its evolution is far from complete. Upcoming innovations such as **UPI Lite** and **Credit on UPI** are set to extend its scope and influence. UPI Lite is designed to make low-value transactions faster and more reliable by allowing payments directly from the device without the need for constant bank authentication. This reduces the strain on banking servers while making microtransactions seamless for users. On the other hand, Credit on UPI blurs the line between UPI and traditional credit cards by linking pre-approved credit lines to UPI IDs. Together, these innovations demonstrate how UPI is moving beyond being just a payments interface to becoming an all-encompassing financial services ecosystem.

Parallel to these developments is the gradual introduction of the **Digital Rupee**, India's central bank digital currency (CBDC). Unlike UPI, which functions as a transfer mechanism on top of existing bank accounts, the Digital Rupee is a sovereign-backed digital instrument that could alter the very structure of settlement. If adopted widely, it could lower transaction costs, improve settlement efficiency, and provide transparency in cross-border payments. However, its success will depend heavily on consumer trust, regulatory clarity, and the ability of banks to support its infrastructure while managing the risks of reduced deposit bases.

The rise of UPI and potential adoption of CBDCs force banks to fundamentally rethink their roles. With UPI transactions carrying zero merchant discount rates (MDR), banks have already lost a major source of fee income. To remain competitive, banks need to reposition themselves. This involves embedding value-added services such as loyalty programs, insurance, and investment products into their digital offerings. Partnerships with fintechs can allow banks to leverage artificial intelligence for fraud detection, credit scoring, and customer engagement. Furthermore, UPI's vast transaction data can be used to build innovative lending products, such as microcredit or buy-now-pay-later schemes, which extend financial inclusion while creating new revenue streams. In short, banks must shift from resisting UPI's disruption to capitalizing on its opportunities.

A central question is whether UPI and credit cards will ultimately converge or continue to coexist. While UPI is increasingly dominant for everyday low- and mid-value transactions, credit cards continue to thrive in high-ticket spending, cross-border payments, and through their established loyalty ecosystems. The arrival of Credit on UPI has the potential to merge these functions by offering credit-like features without a physical card, using UPI as the unified front-end. In the near future, coexistence seems the most likely scenario, with both systems catering to distinct needs. However, the long-term trajectory points toward convergence, where UPI could serve as the digital interface for both debit and credit, leaving banks and card networks to manage the back-end infrastructure.

Taken together, the findings of this study suggest that UPI has fundamentally transformed India's digital payments landscape by emphasizing inclusivity, cost efficiency, and real-time convenience. Credit cards, while under pressure, remain relevant for larger purchases, global acceptance, and customer reward programs. Banks face significant challenges in adapting to the zero-MDR regime, but innovations such as UPI Lite, Credit on UPI, and the Digital Rupee will likely expand the adoption of digital payments while reshaping revenue models. Moreover, the Aadhaar Enabled Payment System (AEPS) complements UPI by serving rural communities, ensuring that digital financial inclusion is not limited to urban centers.

From a policy perspective, several measures could help balance innovation with sustainability. Regulators should consider revisiting MDR policies to ensure that banks and fintechs remain financially viable while merchants continue to benefit from affordable acceptance. Expanding digital literacy initiatives, particularly in regional languages, will be critical to deepening adoption in semi-urban and rural areas. At the same time, interoperability frameworks will be necessary to ensure smooth coexistence between UPI and the Digital Rupee. Policymakers should also encourage the responsible use of UPI transaction data to build innovative lending models while safeguarding privacy and consumer rights. Finally, sustained investment in cybersecurity and fraud prevention will be essential to preserving trust, which remains the foundation of India's digital payments revolution.